

## 1. Material Identification

**Product Name** : Pyrogallol

**Catalog Number** : io-44648

**CAS Number** : 87-66-1

**Identified uses** : Laboratory chemicals, manufacture of chemical compounds

**Company** : Ionz

>> R&D Use only

## 2. Hazards Identification

### GHS Classification:

Flammable liquid ( category 2 )

Acute toxicity, oral (Category 3)

Acute toxicity, dermal (Category 3)

Acute toxicity, inhalation (Category 3)

Specific target organ toxicity, single exposure (Category 1)

### Pictogram(s)



>> Warning

### GHS Hazard Statements

- >> H302+H312+H332 (11.2%): Harmful if swallowed, in contact with skin or if inhaled [Warning Acute toxicity, oral; acute toxicity, dermal; acute toxicity, inhalation]
- >> H302 (93.9%): Harmful if swallowed [Warning Acute toxicity, oral]
- >> H312 (100%): Harmful in contact with skin [Warning Acute toxicity, dermal]
- >> H315 (22.7%): Causes skin irritation [Warning Skin corrosion/irritation]
- >> H317 (12.3%): May cause an allergic skin reaction [Warning Sensitization, Skin]
- >> H319 (22.7%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]
- >> H332 (100%): Harmful if inhaled [Warning Acute toxicity, inhalation]
- >> H336 (11.7%): May cause drowsiness or dizziness [Warning Specific target organ toxicity, single exposure; Narcotic effects]
- >> H341 (100%): Suspected of causing genetic defects [Warning Germ cell mutagenicity]
- >> H351 (11.7%): Suspected of causing cancer [Warning Carcinogenicity]
- >> H412 (94.1%): Harmful to aquatic life with long lasting effects [Hazardous to the aquatic environment, long-term hazard]

### Precautionary Statement Codes

- >> P203, P261, P264, P264+P265, P270, P271, P272, P273, P280, P301+P317, P302+P352, P304+P340, P305+P351+P338, P317, P318, P319, P321, P330, P332+P317, P333+P317, P337+P317, P362+P364, P403+P233, P405, and P501

### NFPA 704 Diamond



#### NFPA Health Rating

>> 3 – Materials that, under emergency conditions, can cause serious or permanent injury.

#### NFPA Fire Rating

>> 0 – Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

#### NFPA Instability Rating

>> 0 – Materials that in themselves are normally stable, even under fire conditions.

#### Health Hazards:

>> Inhalation of dust causes irritation of nose and throat. Ingestion may cause severe gastrointestinal irritation, convulsions, circulatory collapse, and death. Contact with eyes causes irritation. Skin contact can cause local discoloration, irritation, eczema, and death; repeated contact can cause sensitization. (USCG, 1999)

>> This compound is probably combustible. (NTP, 1992)

>> Combustible. Finely dispersed particles form explosive mixtures in air.

### 3. Composition/Information On Ingredients

**Chemical name** : Pyrogallol

**CAS Number** : 87-66-1

**Molecular Formula** : C<sub>6</sub>H<sub>6</sub>O<sub>3</sub>

**Molecular Weight** : 126.1100 g/mol

### 4. First Aid Measures

#### First Aid:

>> EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

>> SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: DO NOT INDUCE VOMITING. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. Be prepared to transport the victim to a hospital if advised by a physician. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

#### First Aid Measures

##### Inhalation First Aid

>> Fresh air, rest. Seek medical attention if you feel unwell.

##### Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower.

#### **Eye First Aid**

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### **Ingestion First Aid**

>> Rinse mouth. Refer for medical attention .

## **5. Fire Fighting Measures**

>> Emits toxic vapors when heated.

>> Fire Extinguishing Agents: Water, foam, dry chemical, carbon dioxide (USCG, 1999)

>> Use water, foam, dry powder, carbon dioxide.

## **6. Accidental Release Measures**

### **Isolation and Evacuation:**

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 154 [Substances – Toxic and/or Corrosive (Non-Combustible)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

### **Spillage Disposal:**

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

## **7. Handling And Storage**

### **Safe Storage:**

>> Separated from strong oxidants and strong bases.

### **Storage Conditions:**

>> /Store/ separated from strong oxidants, strong bases.

## **8. Exposure Control/ Personal Protection**

### **Inhalation Risk:**

>> Evaporation at 20 °C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

### **Effects of Short Term Exposure:**

>> The substance is irritating to the eyes and respiratory tract. The substance is mildly irritating to the skin.

### Effects of Long Term Exposure:

>> Repeated or prolonged contact may cause skin sensitization.

### Fire Prevention

>> NO open flames. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust.

### Exposure Prevention

>> PREVENT DISPERSION OF DUST!

### Inhalation Prevention

>> Use local exhaust or breathing protection.

### Skin Prevention

>> Protective gloves. Protective clothing.

### Eye Prevention

>> Wear safety spectacles.

### Ingestion Prevention

>> Do not eat, drink, or smoke during work.

## 9. Physical And Chemical Properties

### Molecular Weight:

>> 126.11

### Exact Mass:

>> 126.031694049

### Physical Description:

>> Pyrogalllic acid is an odorless white to gray solid. Sinks and mixes with water. (USCG, 1999)

>> WHITE SOLID IN VARIOUS FORMS. TURNS GREY ON EXPOSURE TO LIGHT AND AIR.

### Color/Form:

>> White, lustrous crystals or plates

### Odor:

>> Odorless

### Boiling Point:

>> 588 °F at 760 mmHg (Decomposes at 559 °F) (NTP, 1992)

>> 309 °C

### Melting Point:

>> 271 to 273 °F (NTP, 1992)

>> 131-134 °C

### Solubility:

>> greater than or equal to 100 mg/mL at 77 °F (NTP, 1992)

>> Solubility in water, g/100ml at 20 °C: 60 (good)

### Density:

>> 1.45 at 68 °F (USCG, 1999) - Denser than water; will sink

>> Relative density (water = 1): 1.45

### Vapor Pressure:

>> 10 mmHg at 333.9 °F (NTP, 1992)

>> Vapor pressure, kPa at 168 °C: 1.33

**LogP:**

>> 0.970 (estimated)

**Stability/Shelf Life:**

>> BECOMES GRAYISH ON EXPOSURE TO AIR & LIGHT; AQ SOLN DARKENS ON EXPOSURE TO AIR, QUITE RAPIDLY WHEN ALKALINE

**Decomposition:**

>> When heated to decomposition it emits acrid smoke and irritating fumes.

**Heat of Combustion:**

>> 2.673 MJ/mol (638.9 kcal/mol)

**Refractive Index:**

>> Index of refraction: 1.561 at 134 °C/D

**Dissociation Constants:**

>> pKa = 9.01

## 10. Stability And Reactivity

>> Turns gray on exposure to light or air. Water soluble.

>> Strong Reducing Agent

## 11. Toxicological Information

**Exposure Routes:**

>> The substance can be absorbed into the body by ingestion.

**Inhalation Exposure**

>> Cough. Sore throat.

**Skin Exposure**

>> Redness.

**Eye Exposure**

>> Redness. Pain.

**Ingestion Exposure**

>> Vomiting. Diarrhoea.

**Adverse Effects:**

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Occupational hepatotoxin - Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

>> Methemoglobinemia - The presence of increased methemoglobin in the blood; the compound is classified as secondary toxic effect

>> Skin Sensitizer - An agent that can induce an allergic reaction in the skin.

**Interactions:**

>> ... The involvement of various molecular events in pyrogallol-mediated hepatotoxicity was deciphered by differential mRNA transcription profiles of control and pyrogallol treated mice liver. The modulatory effects of silymarin on pyrogallol-induced differentially expressed transcripts were also looked into. Swiss albino mice were treated with or without pyrogallol. In some sets of experiments, mice were also treated with silymarin 2 hr prior to pyrogallol. Total RNA was isolated from liver and polyadenylated RNA was reverse-transcribed into Cye 3 or Cye 5 labeled cDNA. Equal amounts of labeled cDNA from two different groups were mixed and hybridized with mouse 15k array. The hybridized arrays were scanned, analyzed and the expression level of each transcript was calculated. The differential expression was validated by quantitative real time polymerase chain reaction. Comparative transcription pattern showed an

alteration in the expression of 183 transcripts (150 up-regulated and 33 down-regulated) associated with oxidative stress, cell cycle, cytoskeletal network, cell-cell adhesion, extra-cellular matrix, inflammation, apoptosis, cell-signaling and intermediary metabolism in pyrogallol-exposed liver and silymarin pre-treatment modulated the expression of many of these transcripts. Results obtained thus suggest that pyrogallol induces multiple molecular events leading to hepatotoxicity and silymarin effectively counteracts pyrogallol-mediated alterations.

#### **Antidote and Emergency Treatment:**

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Phenols and related compounds/

#### **Human Toxicity Excerpts:**

>> /SIGNS AND SYMPTOMS/ Repeated or prolonged contact may cause skin sensitization.

#### **Non-Human Toxicity Excerpts:**

>> /LABORATORY ANIMALS: Acute Exposure/ ... The free radical generator pyrogallol (100 mg/kg ip) caused significant hepatic damage. The serum enzymes aspartate aminotransaminase (AST) and alanine aminotransaminase (ALT) increased to 357 +/- 30.7 IU/L and 147.8 +/- 28.4 IU/L, respectively in the pyrogallol-treated group compared with 208.4 +/- 4.1 IU/L and 84.5 +/- 19.5 IU/L, respectively in the control rats. Compared with control rats, the liver tissue in the pyrogallol-treated group showed an increased level of malondialdehyde (MDA) as well as glutathione (GSH). The infiltration of white blood cells into the liver tissue, as seen histologically, further substantiated liver damage. Pretreatment with a standard hepatoprotective drug (silymarin, 100 mg/kg ip) afforded significant protection against pyrogallol hepatotoxicity, as evidenced by amelioration of the raised serum markers of hepatic function, markers of oxidative stress and normal liver histology.

#### **Non-Human Toxicity Values:**

>> LD50 Mouse oral 300 mg/kg

#### **TSCA Test Submissions:**

Under the Toxic Substances Control Act (TSCA), EPA has broad authority to issue regulations designed to require manufacturers (including importers) or processors to test chemical substances and mixtures for health and environmental effects. This section provides information on test reports submitted for this chemical under TSCA.

>> Pyrogallol (CAS # 87-66-1), technical synthetic (92.2%) and natural (98%), were evaluated for dermal irritancy in 6 Dunkin Hartley guinea pigs exposed to 0.05 ml (500 mg/ml distilled water) occluded dermal applications to shaved dorsal skin for 24 hours. Each guinea pig received 2 applications each of technical synthetic and natural pyrogallol upon 0.75 x 0.75 cm lint patches covered with aluminum foil and a waterproof plaster sheath. Dermal responses to technical synthetic and natural pyrogallol were comparable throughout 72-hour observation following removal of patches. All responses, except one for each preparation on a single animal, were characterized by dryness and thickening of the skin eventuating in flaking at 4-8 days after removal of patches, and persisting to end of study. Slight erythema of 4-24 hours' duration was noted on single natural and technical synthetic pyrogallol application sites in 4/6 animals and 3/6 animals, respectively. All signs of erythema were resolved by end of 72-hour post-treatment observation and no injury in depth was reported.

## **12. Ecological Information**

#### **ICSC Environmental Data:**

>> The substance is harmful to aquatic organisms.

## **13. Disposal Considerations**

#### **Spillage Disposal**

>> Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

## Disposal Methods

- >> SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational harm/injury/toxicity or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal and plant life; and conformance with environmental and public health regulations.
- >> A) Dissolve in a flammable solvent and burn in the furnace with afterburner. B) Soak in paper or other flammable materials and burn in the furnace with afterburner. Recommendable methods: Incineration & use as a boiler fuel. Peer review: Dissolve in light fuel oil. (Peer-review conclusions of an IRPTC expert consultation (May 1985))
- >> 1. Liquid acid may be injected at base of incinerator or after mixing with a flammable solvent. Afterburner is suggested for complete combustion. 2. A solid acid may be dissolved in a flammable solvent and burned as above. 3. Solid acid may be packaged in paper or other flammable material and burned in an incinerator.

## 14. Transport Information

### DOT

Pyrogallol

### IATA

Pyrogallol

## 15. Regulatory Information

### Regulatory Information

#### The Australian Inventory of Industrial Chemicals

- >> Chemical: 1,2,3-Benzenetriol

#### REACH Registered Substance

- >> Status: Active Update: 25-11-2019 <https://echa.europa.eu/registration-dossier/-/registered-dossier/25683>
- >> Status: Active Update: 24-05-2021 <https://echa.europa.eu/registration-dossier/-/registered-dossier/20689>

#### New Zealand EPA Inventory of Chemical Status

- >> Pyrogallol: Does not have an individual approval but may be used under an appropriate group standard

## 16. Other Information

### Toxic Combustion Products:

Toxic products (e.g. gases and vapors) produced from the combustion of this chemical.

- >> Hazardous decomposition products formed under fire conditions - Carbon oxides

### Other Safety Information

#### Chemical Assessment

- >> IMAP assessments - 1,2,3-Benzenetriol: Environment tier I assessment
- >> IMAP assessments - 1,2,3-Benzenetriol: Human health tier II assessment

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